Access DB# 76736

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Luz Alejandro Examiner #: 74140 Date: 10/03/02
Art Unit: 1763 Phone Number 305-4545 Serial Number: 09/729193
Mail Box and Bldg/Room Location: Crystal Plaza 3 10B34 Results Format Preferred (circle): PAPER DISK E-MAIL

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****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Plasma CVD apparatus comprising a plasma control electrode

Inventors (please provide full names): Katsuhisa Yuda

Earliest Priority Filing Date: 12/05/2000

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please refer to claims 1-2, 4-5* for specific limitations to be searched.

* claims are in the attached copy

****

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Searcher: K. Fuller	NA Sequence (#)		STN	✓
Searcher Phone #:	AA Sequence (#)		Dialog	
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Date Searcher Picked Up:	Bibliographic	✓	Dr.Link	
Date Completed: 10/3/02	Litigation		Lexis/Nexis	
Searcher Prep & Review Time: 20	Fulltext		Sequence Systems	
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Online Time: 45	Other		Other (specify)	

PTO-1590 (8-01)

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FILE COVERS 1907 - 3 Oct 2002 VOL 137 ISS 14
FILE LAST UPDATED: 2 Oct 2002 (20021002/ED)

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=> d que l55
L52 18628 SEA FILE=HCAPLUS ABB=ON PLASMA(1W)(CVD OR CHEM?(W)VAPO?)
L53 6127 SEA FILE=HCAPLUS ABB=ON L52 AND (APPARATUS? OR DEVICE?)
L54 27 SEA FILE=HCAPLUS ABB=ON L53 AND (PLASMA OR GAS)(2A)CONFIN?
L55 10 SEA FILE=HCAPLUS ABB=ON L54 AND ELECTROD?

=> file wpix
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L56 11 SEA FILE=WPIX ABB=ON L54 AND ELECTROD?

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L57 3 SEA FILE=JICST-EPLUS ABB=ON L54 AND ELECTROD?

=> file japio
FILE 'JAPIO' ENTERED AT 17:43:01 ON 03 OCT 2002
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FILE LAST UPDATED: 11 SEP 2002 <20020911/UP>
FILE COVERS APR 1973 TO MAY 31, 2002

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=> d que l58
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L54 27 SEA FILE=HCAPLUS ABB=ON L53 AND (PLASMA OR GAS)(2A)CONFIN?
L58 11 SEA FILE=JAPIO ABB=ON L54 AND ELECTROD?

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FILE COVERS 1964 TO DATE.

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=> d que l59
L52 18628 SEA FILE=HCAPLUS ABB=ON PLASMA(1W)(CVD OR CHEM?(W)VAPO?)
L53 6127 SEA FILE=HCAPLUS ABB=ON L52 AND (APPARATUS? OR DEVICE?)

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L54          27 SEA FILE=HCAPLUS ABB=ON  L53 AND (PLASMA OR GAS)(2A)CONFIN?
L59           0 SEA FILE=NTIS ABB=ON  L54 AND ELECTROD?


=> file compen
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FILE COVERS 1970 TO DATE.


=> d que l60
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L54          27 SEA FILE=HCAPLUS ABB=ON  L53 AND (PLASMA OR GAS)(2A)CONFIN?
L60           1 SEA FILE=COMPENDEX ABB=ON  L54 AND ELECTROD?


=> file inspec
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FILE COVERS 1969 TO DATE.

=> d que l61
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L54          27 SEA FILE=HCAPLUS ABB=ON  L53 AND (PLASMA OR GAS)(2A)CONFIN?
L61           1 SEA FILE=INSPEC ABB=ON  L54 AND ELECTROD?


=> file ema
FILE 'EMA' ENTERED AT 17:44:01 ON 03 OCT 2002
COPYRIGHT (C) 2002 Cambridge Scientific Abstracts (CSA)

FILE LAST UPDATED: 11 SEP 2002      <20020911/UP>
FILE COVERS 1986 TO DATE.

=> d que l62
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L62           0 SEA FILE=EMA ABB=ON  L54 AND ELECTROD?


=> dup rem l55 l56 l56 l58 l60 l61
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PROCESSING COMPLETED FOR L55
PROCESSING COMPLETED FOR L56
PROCESSING COMPLETED FOR L58
PROCESSING COMPLETED FOR L60
PROCESSING COMPLETED FOR L61
L63 28 DUP REM L55 L56 L56 L58 L60 L61 (6 DUPLICATES REMOVED)

=> d 163 all 1-28

L63 ANSWER 1 OF 28 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 1
AN 2001:417357 HCAPLUS
DN 135:27148
TI **Plasma CVD apparatus** and **plasma CVD** method
IN Yuda, Katsuhisa
PA NEC Corp., Japan
SO U.S. Pat. Appl. Publ., 16 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM B05D003-14
ICS C23C016-509
NCL 427562000
CC 75-1 (Crystallography and Liquid Crystals)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2001003014	A1	20010607	US 2000-729193	20001205
	JP 2001164371	A2	20010619	JP 1999-348157	19991207
PRAI	JP 1999-348157	A	19991207		

AB A remote **plasma CVD app.** is disclosed, in which oxygen gas is supplied to a high frequency wave applying **electrode** to cause reaction of oxygen radicals and oxygen mols. with monosilane gas, which is introduced into part of a substrate processing zone R outside oxygen plasma. The **app.** comprises a **plasma confining electrode**, which has jetting holes for supplying monosilane gas to the substrate processing zone R. The **electrode** is spaced apart from a substrate (i.e., deposition substrate) by a distance no longer than .apprx.1,500 .lambda.g of the mean free path in the substrate processing zone R at the time of film formation. The **electrode** has a hollow structure, and accommodates dispersing plates (i.e., a 1st and a 2nd dispersing plate) for uniform dispersion of monosilane gas (i.e., neutral gas) in it. Thus both of suppression of excessive progress of gas phase chem. reaction and homogeneous film formation in a remote **plasma CVD app.** for forming film by gas phase chem. reaction are realized.
ST **plasma CVD** method **app**
IT Vapor deposition **apparatus**
Vapor deposition process
(**plasma; plasma CVD app.** and

method)
IT 7631-86-9, Silica, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**plasma CVD app.** and method for formation of silica film on substrate)
IT 7782-44-7, Oxygen, processes 7803-62-5, Silane, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(**plasma CVD app.** and method for formation of silica film on substrate using)

L63 ANSWER 2 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2001:356749 HCAPLUS
DN 134:346724
TI **Plasma CVD apparatus**
IN Yuda, Katsuhisa; Ikemoto, Manabu
PA NEC Corp., Japan; Anelva Corp.
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-31
ICS C23C016-505; C23C016-52; H05H001-46
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2001135628	A2	20010518	JP 1999-319402	19991110

AB A **plasma CVD app.** having improved gas-supply uniformity comprises a **plasma-confinement** hollow **electrode** having a no. of gas-diffusion plates which have a no. of holes for passing a neutral gas. The openings of the holes increases from the plasma side to the substrate side of the **electrode.**
ST **plasma CVD app** discharge **electrode**
IT **Electrodes**
(discharge; **plasma-confinement electrode** in **plasma CVD app.**)
IT Vapor deposition **apparatus**
(**plasma; plasma-confinement electrode** in **plasma CVD app.**)

L63 ANSWER 3 OF 28 WPIX (C) 2002 THOMSON DERWENT
AN 2002-218723 [28] WPIX
DNN N2002-167761
TI Reduction of plasma edge effect on **plasma** enhanced **CVD** processes e.g. for semiconductor processing, where **electrode** extension forms a choke aperture in a plasma zone of a substrate processing chamber.
DC U11 V05
IN CHEN, G; LIU, K; SILVETTI, M D; VEERASINGAM, R; XU, P; XU, Z
PA (MATE-N) APPLIED MATERIALS INC
CYC 29

PI EP 1154040	A2 20011114 (200228)* EN	13p	C23C016-509	
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR				
US 2001042511	A1 20011122 (200228)		C23C016-00	
KR 2001104669	A 20011126 (200231)		H01L021-205	
JP 2002158179	A 20020531 (200239)	28p	H01L021-205	

ADT EP 1154040 A2 EP 2001-304259 20010514; US 2001042511 A1 Provisional US 2000-203732P 20000512, US 2001-853397 20010511; KR 2001104669 A KR

2001-26010 20010512; JP 2002158179 A JP 2001-143503 20010514
PRAI US 2000-203732P 20000512; US 2001-853397 20010511
IC ICM C23C016-00; C23C016-509; H01L021-205
ICS B01J019-08; C23C016-455; H01J037-32; H01L021-283; H01L021-3065; H01L021-31; H05H001-46
AB EP 1154040 A UPAB: 20020502
NOVELTY - **Apparatus** for **confining** a **plasma** within a processing chamber, comprises: an upper section having an annular **electrode** mounting surface; and a lower section integrally formed with the upper section having an inner annular confinement wall and an outer annular confinement wall.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following: **apparatus** for distributing a process gas; processing chamber
USE - For semiconductor processing equipment.
ADVANTAGE - Plasma choke aperture reduces the volume of the process zone around the periphery of the substrate thereby eliminating uneven deposition of material around the edge of the substrate.
DESCRIPTION OF DRAWING(S) - The diagram shows the gas delivery assembly
annular part 280
outer confinement wall 287
Dwg.4/6
FS EPI
FA AB; GI
MC EPI: U11-C09B; U11-C09C; V05-F04C1A; V05-F05C3; V05-F08D1

L63 ANSWER 4 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 2000:638424 HCAPLUS
DN 133:230683
TI **Plasma CVD apparatus** and fabrication of silicon thin film photoelectric **device**
IN Okamoto, Keishi; Yamamoto, Kenji
PA Kanegafuchi Chemical Industry Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-205
ICS C23C016-24; C23C016-50; H01L031-04
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2000252216	A2	20000914	JP 1999-50591	19990226

AB A **plasma CVD app.** useful for depositing a uniform cryst. Si film on a wide substrate comprises a vacuum container, a first **electrode** for supporting a substrate in the container, a second **electrode** which is narrower than the first and has a no. of holes for spraying a reaction gas, a shield for **confining** a **plasma** near the second **electrode**, an exhaust guide placed at a certain distance from the shield, and a means of evacuating the space between the shield and guide. The **electrodes** and/or substrate are moved during the film deposition. The deposition conditions are also described, for fabricating a silicon thin film photoelec. **device** using the above **device**.
ST **plasma CVD app** silicon photoelec **device** fabrication
IT Photoelectric **devices**

(**plasma CVD app.** for deposition of cryst. silicon film and fabrication of silicon thin film photoelec. **device**)

IT Vapor deposition **apparatus**
Vapor deposition process
(**plasma; plasma CVD app.** for deposition of cryst. silicon film and fabrication of silicon thin film photoelec. **device**)

IT 7440-21-3, Silicon, processes
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**plasma CVD app.** for deposition of cryst. silicon film and fabrication of silicon thin film photoelec. **device**)

L63 ANSWER 5 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1999:529305 HCAPLUS
DN 131:152030
TI Reactor for chemical vapor deposition
IN Koai, Keith; Johnson, Mark; Chang, Mei; Lei, Lawrence Chung Lai
PA Applied Materials, Inc., USA
SO PCT Int. Appl., 45 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C23C016-44
ICS C23C016-50
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9941426	A1	19990819	WO 1999-US2841	19990209
	W: JP				
	US 6063441	A	20000516	US 1997-982727	19971202
	US 6106625	A	20000822	US 1998-23852	19980213
	TW 401591	B	20000811	TW 1998-87118960	19981116
	WO 9928945	A1	19990610	WO 1998-US25499	19981201
	W: JP, KR				
	JP 2001525495	T2	20011211	JP 2000-523694	19981201
	JP 2002503765	T2	20020205	JP 2000-531602	19990209
PRAI	US 1998-23852	A	19980213		
	US 1997-982727	A1	19971202		
	WO 1998-US25499	W	19981201		
	WO 1999-US2841	W	19990209		

AB A plasma reaction chamber particularly configured for CVD of Ti nitride with a TDMAT (tetrakis(dimethylamido)titanium) precursor, with the deposition including a plasma step, is given. Gas is injected from a gas cavity in a showerhead **electrode** assembly through a large no. of showerhead holes into the processing region over the wafer. The showerhead **electrode** is capable of being RF energized to create a plasma of a gas in the processing region. The showerhead **electrode** and other parts of the assembly are cooled by a cooling plate disposed above the gas cavity and connected to a rim of the showerhead **electrode**. A convolute H2O-cooling channel is formed in the cooling plate having a small cross section and numerous bends so as to create turbulent flow, thus aiding thermal transfer. The H2O cooling plate is connected to the showerhead **electrode** across a large horizontal interface, thus also aiding thermal flow. An edge ring assembly is positioned in a peripheral recess at the top of a heater

pedestal supporting the wafer next to the processing region. The showerhead is insulated from the chamber body by an isolator having a downwardly sloping lower surface facing the processing region. Thereby, the isolator by itself or in combination with a **plasma confinement** ring around the wafer **confines** the **plasma** to the process area and induces the exhaust to flow downwardly from the processing region. The assembly includes a Z-shaped heat shield disposed between the walls of the recess and of the pedestal side and other parts of the ring assembly with gaps between the various members, thereby promoting thermal isolation in the edge region as well as protecting the side of the pedestal. Ti can also be deposited by this **plasma CVD app**.

ST **plasma CVD** reactor titanium nitride methylamidotitanium precursor

IT Heat shields
(for reactor for **plasma CVD** of titanium nitride using precursor tetrakis(dimethylamido)titanium)

IT Vapor deposition **apparatus**
(plasma; for titanium nitride using precursor tetrakis(dimethylamido)titanium)

IT 7440-32-6, Titanium, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(reactor for **plasma CVD** of)

IT 3275-24-9, Tetrakis(dimethylamido)titanium 25583-20-4, Titanium nitride tin
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(reactor for **plasma CVD** of titanium nitride using precursor tetrakis(dimethylamido)titanium)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Applied Materials Inc; EP 0780490 A 1997 HCAPLUS
(2) Applied Materials Inc; EP 0818558 A 1998 HCAPLUS
(3) Collins, K; US 4960488 A 1990 HCAPLUS
(4) Ebara Corp; EP 0835950 A 1998 HCAPLUS
(5) Yuichiro, F; US 5595606 A 1997 HCAPLUS

L63 ANSWER 6 OF 28 JAPIO COPYRIGHT 2002 JPO

AN 1998-289431 JAPIO

TI PRODUCTION OF MAGNETIC HEAD SLIDER

IN YAMAMOTO IZUMI

PA CITIZEN WATCH CO LTD

PI JP 10289431 A 19981027 Heisei

AI JP 1997-97166 (JP09097166 Heisei) 19970415

PRAI JP 1997-97166 19970415

SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1998

IC ICM G11B005-60
ICS G11B005-127; G11B005-40; G11B021-21

AB PROBLEM TO BE SOLVED: To provide a magnetic head slider having a film thickness of good accuracy by specifying the spacing between a substrate **electrode** mounted with the deposition substrate of a **plasma CVD** system and a grounding **electrode** facing this **electrode, confining plasma** between these **electrode** and forming a protective film so as to prevent the spread to a transverse direction.
SOLUTION: The plasma deposition **apparatus** for executing deposition includes the substrate **electrode** 1 mounted with solder 5 for deposition and the grounding **electrode** 3 facing the same in a vacuum chamber. After the inside of the vacuum chamber is evacuated, a gaseous hydrocarbon material is introduced into the vacuum chamber and a negative voltage of -700 to 1000 V is impressed to form the

plasma and to execute the deposition. The protective film to be adhered is a diamond-like carbon film. The spacing between the substrate **electrode** 1 and the grounding **electrode** 3 is set at a value of 1.05 to 1.5 times of the min. facing (distance between the critical **electrode**) at which the plasma may be maintained. The surface of the substrate **electrode** 1 not facing the grounding **electrode** 3 is coated with an insulator 9. As a result, the thickness of the protective film and the distribution of the film quality are made uniform and the protective film having the good accuracy is obtd.
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L63 ANSWER 7 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 1998-012558 JAPIO
TI **APPARATUS** AND METHOD FOR **PLASMA CHEMICAL VAPOR** DEPOSITION
IN AOI TATSUFUMI; MORITA SHOJI; TAKEUCHI YOSHIAKI
PA MITSUBISHI HEAVY IND LTD
PI JP 10012558 A 19980116 Heisei
AI JP 1996-167229 (JP08167229 Heisei) 19960627
PRAI JP 1996-167229 19960627
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1998
IC ICM H01L021-205
ICS C23C016-50
AB PROBLEM TO BE SOLVED: To form a uniform amorphous thin film at a high forming rate by a **plasma chemical vapor** deposition **apparatus** for forming wide area thin films, usable for various electronic **devices**, such as solar cells, thin-film transistors, etc.
SOLUTION: In a reaction vessel 1, a plasma generating **electrode** and ground **electrode** are respectively opposite in an upper and lower spaces with a substrate parallel to them. Two pairs of solenoid coils 14a, 14b and 15a, 15b are disposed on the opposite sides of the vessel 1 with their axes crossed mutually to which the a-c currents being out of phase are fed from their respective etching a-c power sources 16a, 16b, 16c, 16d with a high frequency power fed between the **electrodes**. A phase controller 20 controls the power sources 16a-16d, to alternately generate lines of magnetic force at a central and peripheral areas of the substrate 13. This changes the distribution of a **plasma confined** by the lines of magnetic force, thereby making the film thickness distribution uniform over the ends and central parts of the substrate 13.
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L63 ANSWER 8 OF 28 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 2
AN 1997:528544 HCAPLUS
DN 127:129691
TI Reducing substrate damage during PECVD
IN Cote, Donna Rizzone; Forster, John Curt; Grewal, Virinder Singh; Konecni, Anthony Joseph; Podlesnik, Dragan Valentin
PA International Business Machines Corp., USA; Siemens A.-G.
SO Eur. Pat. Appl., 8 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C23C016-52
ICS C23C016-44; C23C016-50; H01L021-00
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 75
FAN.CNT 1
PATENT NO. KIND DATE APPLICATION NO. DATE

PI	EP 780491	A1	19970625	EP 1996-309088	19961212
	EP 780491	B1	19990804		
	R: DE, FR, GB, IT, NL				
	US 5926689	A	19990720	US 1995-574748	19951219
	JP 09181064	A2	19970711	JP 1996-298637	19961111
	JP 3084243	B2	20000904		
PRAI	US 1995-574748	A	19951219		

AB In a PECVD process, the plasma potential is controlled and maintained at a uniform level to **confine** the **plasma** formed to the gap between the **electrodes** away from the influence of the walls of the discharge chamber. The plasma potential is controlled by operating the system at a high pressure, >12 torr, and monitoring the operation by observing the d.c. bias on the upper or driven **electrode** until a pos. potential, preferably >10 V, is developed. At this point a sym. glow discharge and a controlled plasma exist between the driven **electrode** and the susceptor **electrode**, controllable by maintaining the pressure at 14-20 torr, to reduce plasma damage to the semiconductor body being coated, which maximizes yield.

ST substrate damage redn **plasma** enhanced **CVD**; semiconductor **device plasma CVD** damage redn

IT Vapor deposition process
(plasma; reducing substrate damage during PECVD)

IT Semiconductor **devices**
Transistors
(reducing substrate damage during PECVD in manuf. of)

IT 7664-41-7, Ammonia, processes 7727-37-9, Nitrogen, processes 7803-62-5, Silicon hydride (SiH4), processes 10024-97-2, Nitrogen oxide (N2O), processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(reducing substrate damage during PECVD using gas mixts. contg.)

L63 ANSWER 9 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 1997-031658 JAPIO
TI DEPOSITED FILM FORMING **DEVICE** AND DEPOSITED FILM FORMATION BY HIGH-FREQUENCY **PLASMA CVD** METHOD
IN TAKAI YASUYOSHI
PA CANON INC
PI JP 09031658 A 19970204 Heisei
AI JP 1995-199073 (JP07199073 Heisei) 19950712
PRAI JP 1995-199073 19950712
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1997
IC ICM C23C016-50
ICS G03G005-08; H01L021-205; H01L031-04; H01L031-0248

AB PROBLEM TO BE SOLVED: To provide a high-frequency **plasma CVD** method capable of assuring the stability and uniformity of electric discharge and efficiently producing homogeneous deposited films having excellent characteristics.
SOLUTION: The relation between the size of cylindrical supporting bodies 204 enclosing a discharge space 210 and the distances between these cylindrical supporting bodies are set at a prescribed relation to increase the effect of **confining plasma** into the discharge space 210. The pressure in the discharge space 210 and the pressure on the outside 211 of the discharge space within a specified range are so set as to attain a prescribed pressure ratio. A reaction vessel 201 with which vacuum hermetic sealing is possible is thereby so constituted that the discharge in the discharge space 210 is made more easily generated than in the outside 211 of the discharge space. The plural cylindrical supporting bodies 204 are arranged in such reaction vessel so as to enclose the discharge space 210. The discharge space 210 enclosed by these bodies is

provided with at least a cathode **electrode** 208 and a gaseous raw material introducing pipe 209. The high-frequency plasma **device** is thus constituted to induce the glow discharge by introducing high-frequency energy and gaseous raw material therein and to form the deposited films on the cylindrical supporting bodies 204.

L63 ANSWER 10 OF 28 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 3
AN 1997:36764 HCAPLUS
DN 126:67800
TI Low temperature growth of microcrystalline SiC films by **confined plasma CVD** method
AU Yasui, K.; Fujita, H.; Ninagawa, N.; Akahane, T.
CS Department of Electrical Engineering, Nagaoka University of Technology, Niigata, 940-21, Japan
SO Institute of Physics Conference Series (1996), 142(Silicon Carbide and Related Materials 1995), 253-256
CODEN: IPCSEP; ISSN: 0951-3248
PB Institute of Physics Publishing
DT Journal
LA English
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
AB Microcryst. SiC films were prepd. by **confined plasma CVD** method using organosilicon compd. dild. with H for source gas. A wire mesh **electrode** was inserted between the cathode and the anode of conventional diode type radio-frequency plasma **app.** Under large diln. with H gas, excess C atoms were extd. from source gas during deposition. Using the **confined plasma CVD**, microcryst. SiC films with almost stoichiometric compn. were obtained.
ST growth microcryst silicon carbide film CVD
IT Plasma
(design and use for **confined plasma CVD** of microcryst. silicon carbide films)
IT Crystallization
(low temp. growth of microcryst. SiC films by **confined plasma CVD** method)
IT Vapor deposition process
(plasma; low temp. growth of microcryst. SiC films by **confined plasma CVD** method)
IT 409-21-2, Silicon carbide (SiC), processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(low temp. growth of microcryst. SiC films by **confined plasma CVD** method)

L63 ANSWER 11 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 1995-106197 JAPIO
TI MANUFACTURE OF CAPACITOR FOR THIN-FILM CIRCUIT
IN SUZUKI NAOKI; KUDO SHINICHI
PA MATSUSHITA ELECTRIC IND CO LTD
PI JP 07106197 A 19950421 Heisei
AI JP 1993-244462 (JP05244462 Heisei) 19930930
PRAI JP 1993-244462 19930930
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1995
IC ICM H01G004-33
ICS H01G013-00
AB PURPOSE: To obtain the title manufacture wherein a film deposition speed is increased, the deposition of a film on the sidewall or the like of a reaction chamber is reduced and a film stress which is increased by making

the film deposition speed fast is controlled.
CONSTITUTION: A **plasma CVD apparatus** is composed of a reaction chamber 20 which is provided with a reaction-gas introduction pipe 24 and with a vacuum evacuation port 21, of a substrate stand 28 on which a substrate 29 is placed inside the reaction chamber 20, of a heater block 34 which heats the substrate stand 28 and of a high-frequency **electrode** 22 which is installed in a position faced with the substrate stand 28. In the **plasma CVD apparatus**, the distance between the **electrode** 22 and the substrate stand 28 is set at 4 to 10mm, a **plasma** is **confined** in a part between the **electrode** 22 and the substrate stand 28 by a method of supplying low-frequency electric power to the substrate stand 28, a plasma density is increased, and a film deposition speed onto the substrate 29 is increased. In addition, when the low-frequency electric power is supplied to the substrate 29, an ion bombardment to a film is caused, a film density is increased, and a film stress is controlled. By this constitution, the production efficiency of a capacitor for a thin-film circuit can be enhanced, and an insulating film of high reliability can be formed.

L63 ANSWER 12 OF 28 WPIX (C) 2002 THOMSON DERWENT
AN 1994-322600 [40] WPIX
DNN N1994-253332 DNC C1994-147071
TI Microwave discharge **plasma CVD appts.** for forming film on semiconductor wafer - cumene **plasma** is **confined** in box space between microwave supply **electrode** and earthed wafer tray.
DC L03 M13 U11 V05
PA (HITF) HITACHI ZOSEN CORP
CYC 1
PI JP 06248457 A 19940906 (199440)* 4p C23C016-44
JP 2993813 B2 19991227 (200006) 5p C23C016-44
ADT JP 06248457 A JP 1993-37684 19930226; JP 2993813 B2 JP 1993-37684 19930226
FDT JP 2993813 B2 Previous Publ. JP 06248457
PRAI JP 1993-37684 19930226
IC ICM C23C016-44
ICS C23C016-50
AB JP 06248457 A UPAB: 19941128
Plasma is **confined** in the box space formed between a microwave supply **electrode** and a wafer tray set to an earth potential.
ADVANTAGE - The plasma density on the wafer can be distributed uniformly.
Dwg.1/3
FS CPI EPI
FA AB; GI
MC CPI: L04-C01B; L04-D04; M13-E02; M13-E07
EPI: U11-C05B2; U11-C09B; U11-C09C; V05-F04D1; V05-F04G; V05-F05C1A; V05-F08D1

L63 ANSWER 13 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 1994-057435 JAPIO
TI **PLASMA CVD DEVICE**
IN TERAYAMA NOBUYUKI; NAKASONE MASAMI
PA SHINKO SEIKI CO LTD
PI JP 06057435 A 19940301 Heisei
AI JP 1992-237765 (JP04237765 Heisei) 19920812
PRAI JP 1992-237765 19920812
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1994

IC ICM C23C016-50
ICS H05H001-46
AB PURPOSE: To form a reaction film while maintaining a substrate at a low temp. by **confining** the **plasma** in the form of a beam by a magnetic field and disposing the substrate in the outer peripheral part in the diametral direction of the beam-shaped plasma and outside a discharge region.
CONSTITUTION: The plasma is introduced from a plasma source 1 having a main coil 14 for assisting an arc discharge into a vacuum chamber 2 which is subjected to a pressure reduction and grounding. The gaseous material supplied from a nozzle 13 is activated by the plasma and the reaction film is formed on the substrate 11 maintained at a prescribed temp. A plasma reflection **electrode** 17 is disposed to face the plasma source 1 and an auxiliary coil 20 generating a magnetic field is disposed near the **electrode**. As a result, the **plasma** is **confined** to a beam shape between the plasma source 1 and the reflection **electrode** 17. Further, the substrate 11 is disposed in the outer peripheral part in the diametral direction of this beam-shaped plasma and outside the discharge region. As a result, the bombardment of the substrate 11 by the high- energy electrons existing in the plasma is suppressed and the temp. rise of the substrate 11 is prevented.

L63 ANSWER 14 OF 28 WPIX (C) 2002 THOMSON DERWENT
AN 1993-313280 [40] WPIX
DNN N1993-241246 DNC C1993-139170
TI Plasma generator - having a high frequency rotating electric field and magnetic field confining electrons in the plasma generator.
DC L03 U11 V05 X14
IN HARAFUJI, K; KUBOTA, M; NOMURA, N; OHKUNI, M; TAMAKI, T
PA (MATU) MATSUSHITA ELEC IND CO LTD; (MATU) MATSUSHITA ELECTRIC IND CO LTD
CYC 5
PI EP 563899 A1 19931006 (199340)* EN 34p H05H001-18
R: DE FR GB
JP 06045094 A 19940218 (199412) 15p H05H001-46
US 5345145 A 19940906 (199435) 30p H01J007-24
EP 563899 B1 19970730 (199735) EN 35p H05H001-18
R: DE FR GB
DE 69312544 E 19970904 (199741) H05H001-18
ADT EP 563899 A1 EP 1993-105279 19930330; JP 06045094 A JP 1993-72653 19930331; US 5345145 A US 1993-39911 19930330; EP 563899 B1 EP 1993-105279 19930330; DE 69312544 E DE 1993-612544 19930330, EP 1993-105279 19930330
FDT DE 69312544 E Based on EP 563899
PRAI JP 1992-77785 19920331
REP 2.Jnl.Ref; EP 285668; JP 59139627; JP 59232420; US 3442758; US 3523206; US 4572759; US 4792732; WO 8606922
IC ICM H01J007-24; H05H001-18; H05H001-46
ICS C23C016-50; C23F004-00; H01J037-32; H01L021-302
AB EP 563899 A UPAB: 19931129
Plasma is generated in a dry etching process by (a) positioning **electrodes** (5,6,7 and 8) around the sides of a plasma generator section of a vacuum chamber (1) (b) applying to each **electrode** (5,6, 7 and 8) respectively a high frequency electrical energy of the same frequency, but differing phase for each **electrode**, forming a rotating electric field which causes oscillation or rotation of the electrons in the plasma generator (c) apply a magnetic field at right angles to the rotating electric field to convert the translationary movement of the electrons into a revolving movement in the generator, whilst confining the electrons within the plasma generator. **Appts** . is also claimed for operating the above method and having a plasma

generator with a number of laterally positioned **electrodes**, a high frequency power supply, and a magnetic field generator.
USE/ADVANTAGE - The method and **appts**. are useful in plasma generation for miniaturised semiconductor processing, such as dry etching, sputtering other thin film deposition and removal techniques, by converting the translatory motion of the plasma electrons into a revolving motion, the electrons are confirmed within the generator giving a highly dense plasma of excellent uniformity under high vacuum.
Dwg.1/21
FS CPI EPI
FA AB; GI
MC CPI: L03-H04D
EPI: U11-C07A1; U11-C09B; U11-C09C; V05-F04A5A; V05-F05A7C; V05-F05C1; V05-F05C3; V05-F05E3; V05-F05E5; V05-F08D1; V05-F08E1; X14-F02

L63 ANSWER 15 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 1993-315268 JAPIO
TI **PLASMA CVD APPARATUS**
IN SUZUKI NAOKI; HOUCHIN RIYUUZOU; ISHIDA TOSHIMICHI; YAMADA YUICHIRO
PA MATSUSHITA ELECTRIC IND CO LTD
PI JP 05315268 A 19931126 Heisei
AI JP 1992-120396 (JP04120396 Heisei) 19920513
PRAI JP 1992-120396 19920513
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1993
IC ICM H01L021-205
ICS H01L021-31; H01L021-314; H05H001-46
AB PURPOSE: To reduce deposition of a film on a sidewall, etc., of a reaction chamber, to accelerate a film depositing speed and to control a film stress by providing a shielding plate on the side faces of both an **electrode** and a substrate base, and specifying an interval between the **electrode** the base.
CONSTITUTION: Shielding plates 29, 30 ground at an interval of 1-2mm are respectively provided on an **electrode** 16 and a substrate base 22. A high frequency power is applied to the **electrode** 16, a low frequency power is applied to the base 22, and a distance between the **electrode** 16 and the base 22 is set to 4-10mm. Thus, a **plasma** is **confined** between the **electrode** and the base to increase a film depositing speed. Even if a film depositing speed is further increased, an SiN film of high quality having a small stress can deposited. In comparison with the case where the distance between the **electrode** and the base 23 is 11mm or more, a film depositing amount on the sidewall of a reaction chamber 14 is reduced.
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L63 ANSWER 16 OF 28 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 4
AN 1992:266265 HCAPLUS
DN 116:266265
TI **Plasma**-enhanced **chemical vapor** processing system using hollow-cathode effect
IN Blum, Joseph M.; Bumble, Bruce; Chan, Kevin K.; Conde, Joao R.; Cuomo, Jerome J.; Kane, William F.
PA International Business Machines Corp., USA
SO Eur. Pat. Appl., 19 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C23C016-50
ICS H01J037-32
CC 75-1 (Crystallography and Liquid Crystals)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 478984	A1	19920408	EP 1991-115141	19910907
	R: DE, FR, GB				
	US 5133986	A	19920728	US 1990-593141	19901005
	JP 04234111	A2	19920821	JP 1991-181845	19910626
PRAI	US 1990-593141		19901005		

AB The **app.**, for etching a surface or growing or depositing films on it in a reaction chamber, comprises a 1st **electrode** in the chamber; means for supporting a workpiece having a surface to be treated at the 1st **electrode**; a 2nd **electrode** surrounding the 1st **electrode** and the workpiece support and acting as a confining **electrode**; means for providing a supply of reacting gas between the **electrodes**; and means for applying elec. power to the **electrodes** to produce from the reacting **gas** a **confined plasma** with hollow-cathode effect at the surface of the workpiece.

ST **plasma** enhanced **chem vapor** processing system; hollow cathode effect chem vapor processing

IT Sputtering
(etching, **app.** and method for, using hollow-cathode effect)

IT Vapor deposition processes
(plasma, using hollow-cathode effect, **app.** and method for)

IT Etching
(sputter, **app.** and method for, using hollow-cathode effect)

IT 7440-21-3, Silicon, miscellaneous
RL: MSC (Miscellaneous)
(hydrogenated amorphous, **plasma**-enhanced **chem. vapor** deposition of, **app.** and method for)

IT 1333-74-0, Hydrogen, uses
RL: USES (Uses)
(silicon amorphous films contg., **plasma**-enhanced **chem. vapor** deposition of, **app.** and method for)

L63 ANSWER 17 OF 28 WPIX (C) 2002 THOMSON DERWENT

AN 1991-126592 [18] WPIX

DNN N1991-097420 DNC C1991-054479

TI Aluminium film by selective **plasma chemical vapour** deposition - on substrate surface which is only partially metallic or semiconductive using tri methyl-aluminium and hydrogen.

DC L03 M13 U11

IN MASU, K; MIKOSHIBA, N; TSUBOUCHI, K

PA (CANO) CANON KK

CYC 18

PI	EP 425090	A	19910502 (199118)*	16p		
	R: AT BE CH DE ES FR GB GR IT LI LU NL SE					
	PT 95433	A	19910522 (199124)			
	JP 03111571	A	19910513 (199125)			
	US 5091210	A	19920225 (199211)	12p		
	EP 425090	B1	19950419 (199520) EN	21p	C23C016-20	
	R: AT BE CH DE DK ES FR GB GR IT LI LU NL SE					
	DE 69018764	E	19950524 (199526)		C23C016-20	
	KR 9403098	B1	19940413 (199604)		C23C016-20	
	JP 2726118	B2	19980311 (199815)	12p	C23C016-20	

ADT EP 425090 A EP 1990-310268 19900919; JP 03111571 A JP 1989-250028 19890926; US 5091210 A US 1990-584637 19900919; EP 425090 B1 EP 1990-310268 19900919; DE 69018764 E DE 1990-618764 19900919, EP 1990-310268 19900919; KR 9403098 B1 KR 1990-15300 19900926; JP 2726118 B2 JP 1989-250028 19890926

FDT DE 69018764 E Based on EP 425090; JP 2726118 B2 Previous Publ. JP 03111571

PRAI JP 1989-250028 19890926
REP 3.Jnl.Ref; EP 183254; JP 63047364; 02Jnl.Ref
IC B05D003-06; B05D005-12; C23C016-20; C25D003-42; H01L021-28
ICM C23C016-20
ICS B05D003-06; B05D005-12; C23C016-44; C23C016-50; C25D003-42; H01L021-28; H01L021-285
AB EP 425090 A UPAB: 19951221
Plasma CVD method is used to deposit an aluminium film on a substrate. The substrate has an electron donative surface (A) and a non-electron donative surface (B). The aluminium film is deposited on (A).
The substrate 1 is placed in the wide portion of a reaction tube 2, the plasma being generated by 3-**electrode** system 3. Trimethylaluminium, opt. with a Si cpd. such as Si2H6, from vessel 13 and hydrogen from lines 14 and 15 pass through the plasma toward the heated substrate 1. Plasma-excited trimethylaluminium there forms an aluminium film. If a Si cpd. is present the film is aluminium-silicon.
The wide portion may be horn-, cone- or pyramid-shaped subtending an angle of 10-20 degs. The pressure in the reaction tube may be 0/1-10 torr. Power density is pref. 0.03-0.06 W/cm3 and substrate temp. 180-350 deg.C. Surface (A) is pref. Si, W, Mo, Ta, Al, Cu, Ti or its nitride and certain silicides or alloys. Surface (B) is pref. SiO2, Al203, SiN or SiO2 doped with B or P. The substrate may be slanted.
USE/ADVANTAGE - Deposited films on semiconductors are carbon free and of good conductivity and controllability at a given position. The wide portion of the reaction tube used in forming the film prevents reverse flow such as convection and eddies. @(16pp Dwg.No.1/3)@
1/3
FS CPI EPI
FA AB; GI
MC CPI: L04-C10C; M13-E01
EPI: U11-C05C3; U11-C09B

L63 ANSWER 18 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:620984 HCAPLUS
DN 113:220984
TI Fabrication of light-emitting diode
IN Watanabe, Misuzu
PA Meidensha Electric Mfg. Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L033-00
ICS H01L021-205
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 02224377	A2	19900906	JP 1989-45775	19890227

AB A process of making a LED suited for use in a flat panel display is claimed, which compromises the steps of: forming a p-type amorphous Si carbide hole injection layer using a **plasma chem.** **vapor** deposition, in which a plasma polymn. takes place by glow-discharge of a low-pressure reactant gas mixt. contg. a hydrocarbon, a Si hydride, and a p-type dopant gas, in a vacuum vessel having 2 sets of asym. parallel **electrodes** with an independent voltage controls, an external magnet control for a **plasma confinement,** and a graphite cover on the cathode target; forming a light-emitting layer

consisting of amorphous C-type films using a sputtering method in vacuum vessel filled with a low-pressure H gas, wherein H mols. bombards the graphite cathode; and forming an n-type amorphous Si carbide injection layer using a **plasma chem. vapor** deposition,
in which a plasma polymn. takes place by glow discharge of a low pressure gas mixt. contg. a hydrocarbon, a Si hydride, and an n-type dopant gas in the vacuum vessel. The diode comprises successive stacking of these 3 layers. In the vacuum vessel, the anode is made smaller than the cathode and the substrate for the diode is placed behind of the anode so as to mask out the direct-bombarding depositions. In an alternative embodiment of the LED, a low pressure gas mixt. of H and hydrocarbon is employed for the fabricating. The process facilitates the quality control of individual functional layers.

ST semiconductor diode laser amorphous fabrication

IT Electroluminescent **devices**
(amorphous carbon and silicon carbide, fabrication of)

IT 409-21-2, Silicon carbide, uses and miscellaneous 7440-44-0, Carbon, uses and miscellaneous
RL: PRP (Properties)
(amorphous, film, LED, fabrication of)

L63 ANSWER 19 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1990:46230 HCAPLUS
DN 112:46230
TI **Plasma chemical vapor** deposition **apparatus**
IN Yamagami, Atsushi; Okamura, Nobuyuki
PA Canon K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-205
ICS C23C016-50; H01L031-04
ICA G03G005-08
CC 75-2 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76, 77
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 01057616	A2	19890303	JP 1987-212865	19870828

AB The **app.** comprises application of a magnetic field vertical to a planar **electrode** and a planar substrate between them to **confine** the **plasma.** A Si amorphous film was deposited at 2 .ANG./s and 200 G in magnetic flux d. The deposition rate for wall deposition was 0.01 .ANG./s.

ST magnetic field **plasma confinement** film deposition; silicon amorphous **plasma chem vapor** deposition; **plasma chem vapor** deposition **app**

IT Films
(**plasma chem. vapor** deposition of, with **plasma-confining** magnetic field)

IT 7440-21-3, Silicon, uses and miscellaneous
RL: USES (Uses)
(amorphous, **plasma chem. vapor** deposition of)

L63 ANSWER 20 OF 28 HCAPLUS COPYRIGHT 2002 ACS
AN 1989:564711 HCAPLUS

DN 111:164711
TI **Apparatus** for **plasma chemical vapor** deposition of amorphous films
IN Sasaki, Hajime
PA Mitsubishi Electric Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01L021-205
ICA H01L031-04
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 63307718	A2	19881215	JP 1987-144381	19870609

AB The title **app**. is characterized by installation of a rotating baffle to absorb highly reactive radicals between the substrate **electrode** and the gas-supplying **electrode**. A grid **electrode** may be attached to the rotating baffle to **confine** the **plasma** between the slit and the gas-supplying **electrode**. Thus, the rotating baffle was driven by an ultrasonic vibration motor, SiH* and SiH2* radicals were selectively caught, and an amorphous Si film of high quality was formed.
ST **plasma chem vapor** deposition amorphous film; reactive radical removal chem vapor deposition; amorphous silicon **plasma chem vapor** deposition
IT Films
(amorphous, **plasma chem**. **vapor** deposition of, **app**. for, with selective removal of reactive radicals by rotating baffle)
IT 7440-21-3, Silicon, uses and miscellaneous
RL: USES (Uses)
(amorphous, **plasma chem**. **vapor** deposition of)

L63 ANSWER 21 OF 28 WPIX (C) 2002 THOMSON DERWENT
AN 1988-100180 [15] WPIX
DNN N1988-075956 DNC C1988-044859
TI Hydrogenated amorphous silicon (alloy) film deposition - by **plasma** -**CVD** at controlled frequency to **electrode** spacing ratio.
DC L03 M13 P42 U11
IN CURTINS, H
PA (MICR-N) INST MICROTECHNIQUE; (UYNE-N) UNIV DE NEUCHATEL; (UYNO-N) UNIV NOUCHATEL INST
CYC 15
PI EP 263788 A 19880413 (198815)* FR 10p
R: AT BE CH DE ES FR GB GR IT LI LU NL SE
JP 63197329 A 19880816 (198838)
CH 668145 A 19881130 (198850)
US 4933203 A 19900612 (199031)
EP 263788 B 19910828 (199135)
R: AT BE CH DE ES FR GB GR IT LI LU NL SE
DE 3772506 G 19911002 (199141)
ADT EP 263788 A EP 1987-810548 19870923; JP 63197329 A JP 1987-242397 19870925; US 4933203 A US 1989-376952 19890707
PRAI CH 1986-3868 19860926
REP US 4226898; US 4406765

IC B05D003-06; C23C016-50; H01L021-20; H01L031-04
AB EP 263788 A UPAB: 19930923
(A) Deposition of a hydrogenated amorphous silicon (alloy) semiconductor film on a substrate (7) is carried out in a plasma chamber (2) contg. a pair of **electrodes** (3,4) connected to an h.f. generator (5) by connecting one **electrode** to the substrate spaced by a distance (d) from the other **electrode**, introducing a silicon cpd.-contg. gas into the chamber, and applying h.f. power to the **electrodes** to produce a plasma. The novelty is that the frequency (f) is 25-150 MHz and that the ratio f/d is 30-100 MHz/cm..
(B) **Appts**. for carrying out the process is also claimed.
ADVANTAGE - The deposition rate is increased without increasing the number of defects in the deposit. The number of defects may even be reduced w.r.t. deposits obtained by conventional processes.
1/5
FS CPI EPI GMPI
FA AB; GI
MC CPI: L04-C01B; M13-E02
EPI: U11-C01B; U11-C01J2; U11-C09C

L63 ANSWER 22 OF 28 COMPENDEX COPYRIGHT 2002 EEI
AN 1988(11):159705 COMPENDEX DN 8811111613
TI PLASMA DEPOSITION OF HYDROGENATED AMORPHOUS SILICON FILMS.
AU Luft, Werner (Solar Energy Research Inst, Golden, CO, USA); Tsuo, Simon
SO Appl Phys Commun v 8 n 1 Mar 1988 p 1-74
CODEN: APCODQ ISSN: 0277-9374
PY 1988
DT Journal
TC General Review
LA English
AB **Plasma**-assisted **chemical vapor** deposition has become the most common technique used in the deposition of hydrogenated amorphous silicon films and **devices** for photovoltaic applications.The purpose of this paper is to summarize aspects of glow discharge relevant to the deposition of high-quality hydrogenated amorphous silicon materials and to elucidate the effects on these films and **devices** of various deposition parameters and other aspects of the growth process, to better understand how the films are formed.Common diagnostic measurement techniques for determining plasma composition and film properties are reviewed.Also discussed are some effects on film quality of the deposition-system design, including the **electrode** geometry, bias control, and **plasma confinement**, and the effects of the most significant deposition parameters, such as power density, substrate temperature, feed-gas concentration, pressure, and gas flow rate.(Edited author abstract).213 Refs.
CC 712 Electronic & Thermionic Materials; 714 Electronic Components; 932 High Energy, Nuclear & Plasma Physics; 701 Electricity & Magnetism
CT *SEMICONDUCTING FILMS:Chemical Vapor Deposition; SEMICONDUCTING SILICON:Amorphous; GLOW DISCHARGES; PHOTOVOLTAIC CELLS; PLASMAS:Confinement
ST PLASMA DEPOSITION; HYDROGENATED AMORPHOUS SILICON; **ELECTRODE** GEOMETRY; BIAS CONTROL; POWER DENSITY; SUBSTRATE TEMPERATURE

L63 ANSWER 23 OF 28 WPIX (C) 2002 THOMSON DERWENT DUPLICATE 5
AN 1987-010101 [02] WPIX
DNN N1987-007360 DNC C1987-003860
TI **Plasma CVD appts**. - includes auxiliary wire **electrode** between substrate and spaced discharge **electrode** and auxiliary power circuit.

DC M13 U11
PA (MATU) MATSUSHITA ELEC IND CO LTD
CYC 1
PI JP 61266577 A 19861126 (198702)* 3p
ADT JP 61266577 A JP 1985-107345 19850520
PRAI JP 1985-107345 19850520
IC C23C016-50; H01L021-20; H01L031-08
AB JP 61266577 A UPAB: 19930922
Machine comprises auxiliary wire **electrode**, which is disposed between substrate and spaced discharge **electrode** which is actuated by high-frequency A.C. power, and auxiliary power circuit for applying D.C. or A.C. power at lower frequency than that applied to discharge **electrode**.
ADVANTAGE - Magnetic forces generated by auxiliary **electrode** gather and **confine plasma** electrons in reaction zone.
4/4
FS CPI EPI
FA AB
MC CPI: M13-E07
EPI: U11-C01B

L63 ANSWER 24 OF 28 WPIX (C) 2002 THOMSON DERWENT DUPLICATE 6
AN 1986-164820 [26] WPIX
TI Capacity coupled **plasma CVD device** - has insulation barrier for **confining plasma** in predetermined space between pair of **electrodes** NoAbstract Dwg 4/8.
DC U11
PA (AGEN) AGENCY OF IND SCI & TECHNOLOGY
CYC 1
PI JP 61096724 A 19860515 (198626)* 2p
ADT JP 61096724 A JP 1984-217568 19841017
PRAI JP 1984-217568 19841017
IC H01L021-20; H01L031-04
FS EPI
FA NOAB
MC EPI: U11-C01B

L63 ANSWER 25 OF 28 WPIX (C) 2002 THOMSON DERWENT
AN 1986-045135 [07] WPIX
DNC C1986-018973
TI **Plasma CVD appts.** - comprises vacuum chamber, heated base plate holder and assembly of bar-shaped **electrodes** each surrounded by tubular **electrode.**
DC M13
PA (RICO) RICOH KK
CYC 1
PI JP 60262972 A 19851226 (198607)* 3p
JP 05061350 B 19930906 (199338) 3p C23C016-50
ADT JP 60262972 A JP 1984-117940 19840608; JP 05061350 B JP 1984-117940 19840608
FDT JP 05061350 B Based on JP 60262972
PRAI JP 1984-117940 19840608
IC C23C016-50
AB JP 60262972 A UPAB: 19930922
Appts. comprises vacuum chamber (10), base plate holder (12) incorporating heater (13), and **electrode** assembly (14) spaced from and opposed to the base plate and including bar-shaped **electrodes** each surrounded by a tubular **electrode.**
Reaction gas is introduced into the annular hollow space between the

tubular **electrode** and the bar **electrode** to produce plasma ions.
ADVANTAGE - **Plasma** is **confined** within the tubular chambers.
1/6
FS CPI
FA AB
MC CPI: M13-E05

L63 ANSWER 26 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 1982-056036 JAPIO
TI **PLASMA CHEMICAL VAPOR** PHASE REACTOR
IN HARADA HIROJI; SATO SHINICHI; FUKUMOTO HAYAAKI; TAKANO HIROZO; KOTANI HIDEO; KAYANO SHINPEI
PA MITSUBISHI ELECTRIC CORP
PI JP 57056036 A 19820403 Showa
AI JP 1980-131234 (JP55131234 Showa) 19800920
PRAI JP 1980-131234 19800920
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1982
IC ICM B01J019-08
ICA H01L021-263
AB PURPOSE: To improve the growth rate of films by providing magnets generating magnetic field parallel with the surface of the **electrodes** of a **plasma chemical vapor** phase reactor in the neighborhood of the surface of one of the **electrodes** of said **device.**
CONSTITUTION: In a plasma chemical reactor producing semiconductor films such as silicon nitride films or the like, magnets 12, 12' are provided near the surface of one substrate 7, so that the magnetic lines 13 of force created by these are made parallel with the surface near the surface of a silicon wafer. Then, the electrons generated by **plasma** discharge are **confined** around said magnetic lines of force and therefore the density of plasma is icreased considerably near the magnetic lines of force, that is, on the surface of the silicon wafer, and the growth rate of the films is increased.
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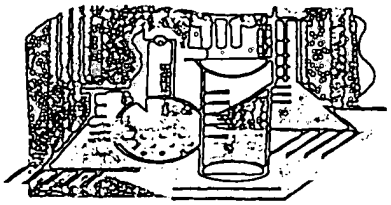
L63 ANSWER 27 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 2002-064064 JAPIO
TI PLASMA PROCESSING **DEVICE**
IN UEDA TATESHI; ASAI MASAYUKI
PA HITACHI KOKUSAI ELECTRIC INC
PI JP 2002064064 A 20020228 Heisei
AI JP 2000-250058 (JP2000250058 Heisei) 20000821
PRAI JP 2000-250058 20000821
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
IC ICM H01L021-205
ICS C23C016-44; C23C016-509; C23F004-00; H01L021-3065; H01L021-31; H05H001-46
AB PROBLEM TO BE SOLVED: To **confine plasma** on a substrate by stopping a plasma sheath on a substrate, which is easy to extend to an exhaust path side from a peripheral part of a substrate.
SOLUTION: In a **plasma CVD device,** a substrate 4 is held on an anode **electrode** 3 inside a vacuum container, processing gas is supplied from a through- hole 5 of a cathode **electrode** 2 toward a processing surface of the substrate 4, and plasma is generated between **electrodes** 2, 3 by applying high frequency power between both the **electrodes** 2, 3. Thus, a predetermined process is applied onto the processed surface of the substrate 4, and gas after processing is exhausted from an exhaust path 7A

in a periphery of the anode **electrode** 3 to an outside of a vacuum container 1. An insulation shielding body 30 having a gas exhaust slit 31 is disposed in a circumference of a space on the anode **electrode** 3 for terminating an equipotential surface in a passage of high frequency power whose medium is plasma in a peripheral part of the substrate 4.

L63 ANSWER 28 OF 28 JAPIO COPYRIGHT 2002 JPO
AN 2001-135628 JAPIO
TI **PLASMA CVD DEVICE**
IN YUDA KATSUHISA; IKEMOTO MANABU
PA NEC CORP
ANELVA CORP
PI JP 2001135628 A 20010518 Heisei
AI JP 1999-319402 (JP11319402 Heisei) 19991110
PRAI JP 1999-319402 19991110
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001
IC ICM H01L021-31
ICS C23C016-505; C23C016-52; H05H001-46
AB PROBLEM TO BE SOLVED: To enhance even gas supply outside a plasma region. SOLUTION: This **plasma CVD device** has a hollow structure of **plasma confinement electrode** plate 5 for plasma isolation being provided with a plurality of holes, between a plasma generation region and a substrate processing region, and the **plasma confinement electrode** plate 5 is provided with a radical passage hole and a neutral gas passage hole, and plural sheets of gas diffusion plates 7 (11 and 12) having holes are provided inside the **plasma confinement electrode** plate. In the **plasma confinement electrode** plate, a gas introduction port 6 for supply gas is arranged. The number of holes of the plural gas diffusion plates 11 and 12 is larger on the side of the substrate processing region more than on the side of the plasma generation region. The gas diffusion plate 7 can be provided, being isolated from the **plasma confinement electrode** plate 5. The numerical aperture and the under-surface distribution of gas passage holes and the connection position of a gas introduction port are contrived.



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(Kathleen Fuller 308-4290) Eric Linnell 308-4143 John Calve 308-4139

All searchers are located in the library in CP3/4 3D62

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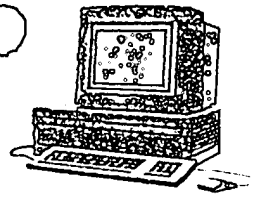
Search Results Feedback Form (Optional)



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Kathleen Fuller, Team Leader, 308-4290, CP3/4 3D62

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- *I am an examiner in Workgroup:* ☐ *Example:* 1713

- *Relevant prior art **found**, search results used as follows:*
  - ☐ 102 rejection
  - ☐ 103 rejection
  - ☐ Cited as being of interest.
  - ☐ Helped examiner better understand the invention.
  - ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
  (journal articles, conference proceedings, new product announcements etc.)

- *Relevant prior art **not found**:*
  - ☐ Results verified the lack of relevant prior art (helped determine patentability).
  - ☐ Search results were not useful in determining patentability or understanding the invention.

Other Comments:

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